

1. *Describe the practice proposed for recognition, and list its objectives. Detail how the practice is innovative, how it promotes high student achievement, and how it can be replicated. (Maximum 50 lines for response)*

With the world around us becoming more technologically advanced, it has become painfully clear that the problems involved with this technology are becoming more advanced as well. With this in mind, it has become increasingly more important that people not only know how to work computers, but that they also know how computers work. "Technical Difficulties" was designed to address these issues.

This innovative program begins with the students gathering around two computers, volunteers show the class a new program. As the volunteers startup the computers, they experience several "Technical Difficulties". One computer shows all of the words on the screen backwards. The other computer's cursor appears to be attached to the end of a spring as it bounces across the screen every time you move the mouse. These problems were created on the Macintosh with two extentions, **Sproing** and **Backwards**. First, I write the symptoms that we observed on the board. Next, theories are discussed about possible causes of these problems, and hypotheses formulated in an attempt to solve the problem. Finally, the hypotheses are tested and the results recorded.

In the following weeks, the students are broken up into cooperative groups and assigned a computer. Each week they experience another "Technical Difficulty" that they are asked to troubleshoot. Each week all symptoms, theories, and results are recorded and shared with the rest of the class.

The last class is reserved for a guest speaker who comes in to talk to the class about a career in computer technical support. Special attention is given to addressing the girls in class to encourage them to pursue a career in this largely male-dominated profession. At the end of the presentation, the guest speaker fields questions about qualifications, education, and experiences.

"Technical Difficulties" was designed with many objectives in mind. First of all, this program is a way for students to sharpen their problem solving skills. Secondly, the students build the confidence needed when attempting to fix a computer's problems. Thirdly, the students gain an appreciation for equality in one of the fastest growing careers. The students also learn the basics of how a computer system works. They are able to identify the causal relationships between the different parts of the computer system.

"Technical Difficulties" is innovative because it was designed to spark the interest of the students toward a career in computer technical support. Surprisingly, there has not been a significant attempt to expose the students to this field, which is one of the most lucrative, promising, and rewarding careers available. "Technical Difficulties" is meant to be a "hands on" program designed to break down that crippling wall of fear that so many people have when it comes to fixing a computer.

This program promotes high student achievement as the students are asked to troubleshoot many problems that most computer users today cannot identify. There is also an understanding with all of the students that they are being trusted to fix an expensive piece of equipment. It is this trust that sets the atmosphere for true learning to take place.

By design, "Technical Difficulties" is easily replicated and adapted on many levels because most of the problems the students encounter can be reproduced on other computers. Some of the problems students face are unplugging various cables, moving system files from the system folder, removing ink cartridges from a printer, switching off a surge protector, removing a mouse ball, hiding programs elsewhere on the computer, and placing items in the startup folder. All of these problems can be reconstructed on almost any computer with the same results. New problems can also be implemented to tailor the program to a specific need.

2. Describe the educational needs of the students that the program addresses and how they were identified. List Core Curriculum Content and/or Cross-Content Workplace Readiness Standards that the practice addresses. (Maximum of 50 lines for response)

Today there is a greater reliance on technology in the workplace as more and more people realize that they cannot do their jobs effectively without the aid of a computer. This movement has led to a surge in the need for individuals with the ability to troubleshoot and maintain the computer systems vital to the operation of nearly every business. This is clearly evident by looking through the classified section of a typical newspaper. Individuals trained in this line of work are in great demand. Since the need for such professionals is high, companies are willing to compensate them handsomely to insure that the computers function properly. Knowing many friends that are in this profession, I began to realize that there were extremely few women in these positions. I found this both surprising and disturbing. "Technical Difficulties" grew from this issue as a means for the students to understand that there is no reason why this lucrative career should be dominated by men.

"Technical Difficulties" address these specific Cross-Content Workplace Readiness Standards:

Standard 1

- Demonstrate employability skills and work habits such as getting along with others needed to get and keep a job.

Standard 2

- Understand how technical systems function.
- Demonstrate skills needed to effectively access and use technology-based materials through troubleshooting.
- Use technology and other tools to solve problems, collect data, and make decisions.
- Discuss problems related to the increasing use of technology.

Standard 3

- Recognize and define a problem, or clarify decisions to be made.
- Use models, relationships, and observations to clarify problems and potential solutions.
- Formulate questions and hypotheses.
- Conduct systematic observations.
- Identify patterns and investigate relationships.
- Monitor and validate their own thinking.
- Identify and evaluate the validity of alternate solutions.
- Interpret and analyze data to draw conclusions.
- Select and apply appropriate solutions to problem-solving and decision-making situations.
- Evaluate the effectiveness of various solutions.

Standard 4

- Work cooperatively with others to accomplish a task.
- Evaluate their own actions and accomplishments.
- Describe actions which demonstrate respect for people of different races, ages, religions, ethnicity, and gender.
- Use time efficiently and effectively.

Standard 5

- Demonstrate safe use of tools and equipment.
- Identify and follow safety procedures for laboratory and other hands-on experiences.

3. *Document the assessment measures used to determine the extent to which the objectives of the practice have been met. (Maximum of 60 lines for response)*

Students are assessed in a number of areas, both individually and as a group. The student's grade is not based on the group's ability to solve the problem, but rather on her thinking processes involved. The students record these processes as they work. At the end of the period, the groups get together and share their results. A speaker from each group must be able to describe the symptoms of the computer, thus showing the group's ability to collect relevant data. They are also responsible for explaining to the rest of the class the basis upon which their group's hypotheses were formulated, showing their understanding of how the computer system works. This is essential in this program because even though the problems of the computer were very specific, there are many other reasons why the same problem could occur. The basis for the group's hypotheses shows that the group understands how the computer system works. This is why all avenues of thought are examined and evaluated. Furthermore, the speaker is responsible for telling the rest of the class what happened when the group tried different methods for fixing the computer. This shows that the students are able to understand the causal relationships between the parts of the computer. Finally, the speaker must describe to the class all safety precautions taken during their troubleshooting session. This is how the assessment is made for the group as a whole.

Individual assessment is based on the student's ability to work cooperatively with the other members of the group. Students are expected to be able to show respect for all members of the group regardless of gender, race, or socioeconomic status by listening to everyone's hypotheses with equal attention. Students are expected to be able to express themselves in a professional manner equally sharing responsibility with the other members of their group. They are expected to define and exhibit organizational roles including a group leader, speaker, and recording secretary. After each class period involving a "Technical Difficulty", the students are asked to rate their own performance with respect to the others in the group as well as define the role that he played in the group. The student's individual portion of his grade was based on these reports and teacher observation. If a student showed equal respect for all members of the group, and shared equal responsibilities with the others, he received a high mark.

As a result of this program, the students have become increasingly curious about different aspects of how a computer system works. Both boys and girls have come to me to discuss problems with their computers at home and to share how they were able to fix them. In addition, when there is a problem with the computer they are working on at school, the students attempt to solve the problem before asking me to fix it for them. Students are eager to figure out everything about the computer, from how the computer works to how to get the most out of a program. "Technical Difficulties" has provided the students with the tools they need to become autonomous users.

The students have developed the confidence needed to enter uncharted territory on the computer. This is an essential skill in the technological world in which we live. As a result of our technological expansion, we are forced to learn new methods to accomplish a task. Unfortunately, this usually occurs just as we become familiar with the old methods. Our only hope in remaining current with technology is to learn to figure out these new methods on your own. These students understand this now, and they are ready for it, "Technical Difficulties" and all.